

Model-Based Specification Checker for Multi-Domain Systems (SpecCheck), Phase I

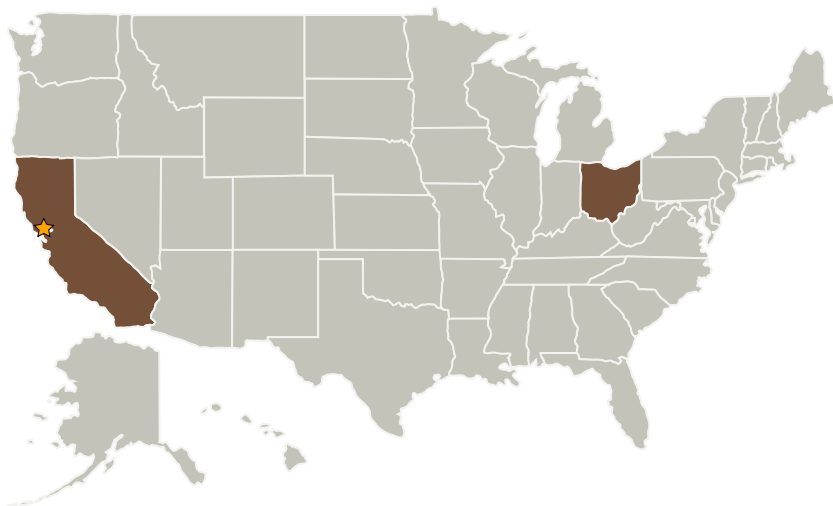
Completed Technology Project (2006 - 2006)



Project Introduction

NASA's software-intensive extraterrestrial exploration and observation systems are raising performance and reliability bars to unprecedented levels. Exaggerating the complexity, in order for such systems to be robust and responsive they must have the ability to use intelligent processes to self-detect and heal, or literally create new programs in response to new situations. Validating the readiness of such complex automated software for long term remote deployment demands not just covering code or branches, or even inputs and outputs, but rather to cover algorithms, rule bases, and states within the system. Even when reducing the order of the problem through traceable model extraction and abstraction we are left with state explosion that drives the test of mission-critical software to unacceptable cost and time extremes. Yet it must be done. This has been a matter of active research at EDaptive Computing, Inc. (ECI), NASA, and elsewhere. Modern specification and software modeling techniques combined with formal methods have yielded promising results. We have demonstrated parts of the solution with smaller scale flight-critical [USAF] software and [MDA] satellite systems. ECI is now uniquely poised to merge and bring the needed technology to fruition at the scale necessary for NASA Exploration Systems.

Primary U.S. Work Locations and Key Partners



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Ames Research Center (ARC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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| Organizations Performing Work | Role | Type | Location |
|-------------------------------|-------------------------|-------------|---------------------------|
| ★ Ames Research Center(ARC) | Lead Organization | NASA Center | Moffett Field, California |
| EDaptive Computing Inc | Supporting Organization | Industry | Dayton, Ohio |

Primary U.S. Work Locations

| | |
|------------|------|
| California | Ohio |
|------------|------|

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX09 Entry, Descent, and Landing
 - └ TX09.4 Vehicle Systems
 - └ TX09.4.5 Modeling and Simulation for EDL